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$$42. \text{ mass of } \text{CaCl}_2 = 1(\text{Ca}) + 2(\text{Cl}) \\ = 1(40.08) + 2(35.45) = 110.98 \text{ g}$$

$$\underline{\% \text{ Ca}} = \frac{40.08}{110.98} \times 100 = 36.11\% \quad \underline{\% \text{ Cl}} = 100\% - 36.11\% = 63.89\%$$

$$43. \text{ mass of } \text{Na}_2\text{SO}_4 = 2(\text{Na}) + 1(\text{S}) + 4(\text{O}) \\ = 2(22.99) + 1(32.07) + 4(16.00) = 142.05 \text{ g}$$

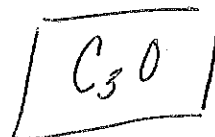
$$\underline{\% \text{ Na}} = \frac{2(22.99)}{142.05} \times 100 = 32.37\% \quad \underline{\% \text{ S}} = \frac{32.07}{142.05} \times 100 = 22.58\%$$

$$\underline{\% \text{ O}} = 100\% - (32.37\% + 22.58\%) = 45.05\%$$

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$$48. 81.82 \text{ g C} \left(\frac{1 \text{ mol}}{12.01 \text{ g}} \right) = \frac{6.8127 \text{ mol C}}{2.2225 \text{ mol}} = 3.06$$

$$35.56 \text{ g O} \left(\frac{1 \text{ mol}}{16.00 \text{ g}} \right) = \frac{2.2225 \text{ mol O}}{2.2225 \text{ mol O}} = 1$$



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$$52. 49.98 \text{ g C} \left(\frac{1 \text{ mol}}{12.01 \text{ g}} \right) = \frac{4.1615 \text{ mol}}{4.1615} = 1$$

$$10.47 \text{ g H} \left(\frac{1 \text{ mol}}{1.01 \text{ g}} \right) = \frac{10.0693}{4.1615} = \sim 2.5$$

$\text{C}_2\text{H}_{2.5}$ multiply by 2

$\text{C}_2\text{H}_5 = \text{empirical formula}$
 $= 29.07 \text{ g}$

$$\frac{58.12 \text{ g}}{29.07 \text{ g}} = \sim 2 \quad \boxed{\text{molecular formula}} \\ \boxed{\text{C}_4\text{H}_{10}}$$

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$$54. 19.55 \text{ g K} \left(\frac{1 \text{ mol}}{39.10 \text{ g}} \right) = \frac{0.5 \text{ mole K}}{0.25} = 2$$

$$4.00 \text{ g O} \left(\frac{1 \text{ mol}}{16.00 \text{ g}} \right) = \frac{0.25 \text{ mol O}}{0.25} = 1$$

